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Drawing Amendments

In Figure 2, please add item '41A' and '41B' as shown in the proposed replacement sheet to identify a CMP apparatus and a Cu-CMP apparatus as disclosed in the Specification at paragraph 0030 along with redrawn item '45'.

In Figure 2, please add item '41C' as shown in the proposed replacement sheet to identify a wafer Backgrinding apparatus as disclosed in the Specification at paragraph 0031.

In Figure 2, please add item '41D' as shown in the proposed replacement sheet to identify a wafer rinsing apparatus as disclosed in the Specification at paragraph 0032.

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Remarks

Thorough examination by the Examiner is noted and appreciated.

The claims have been amended and new claims added to further clarify Applicants invention.

Support for the amended claims is found in the previously presented claims and the Specification.

No new matter has been added.

For example, support for the amendments is found in Figure 2 and paragraphs 0030 and 0031 of the Specification as well as the amended paragraphs and amended drawings as set out above.

Claim Rejections under 35 USC 112

1. Claim 1-16 stand rejected under 35 U>S>C 112, first paragraph, as failing to comply with the written description

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requirement. Examiner alleges that the previously amended claims contain subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, has possession of the claimed invention.

More specifically Examiner alleges that in claims 1 and 9 the following language "lacks clear antecedent basis in the Specification as originally filed, and appear to be drawn to new matter:

a. "to reduce an amount of precipitate forming additive required"

b. "configured to add an additive"

c. "without overflow of said wastewater"

and in claim 9:

d. "said outlet portion configured for adding a second additive"

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With respect to the language in a. "to reduce an amount of precipitate forming additive required", Examiner has been and is now again referred to paragraph 0038 of the Specification:

"The coagulant polymer 60 is added to the combined wastewater in the reaction tank 58, where the coagulant polymer 60 combines with the silica slurry particles, silicon particles and other particles in the combined wastewater to precipitate or sediment the particles out of solution."

Thus, it would be clear to one of ordinary skill that Applicants have explicitly disclosed an additive (coagulant polymer) that forms a precipitate, thus a "precipitate forming additive".

Examiner is referred to specific portions of the MPEP regarding rejection under the written description requirement and concerning new matter:

ADEQUACY OF WRITTEN DESCRIPTION

A. Read and Analyze the Specification for Compliance with 35 U.S.C. 112, para. 1

Office personnel should adhere to the following procedures when reviewing patent applications for compliance with the written description requirement of 35 U.S.C. 112, para. 1. The examiner has the initial burden, after a thorough reading and evaluation of the

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content of the application, of presenting evidence or reasons why a person skilled in the art would not recognize that the written description of the invention provides support for the claims. There is a strong presumption that an adequate written description of the claimed invention is present in the specification as filed, *Wertheim*, 541 F.2d at 262, 191 USPQ; however, with respect to newly added or claims, applicant should show support in the disclosure for the new or amended claims.

"[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968)

It is now well accepted that a satisfactory description may be in the claims or any other portion of the originally filed specification.

See MPEP, 8th Ed, Section 2163 (I)

While there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure.

See MPEP, 8th Ed, Section 2163 (I) (B)

The fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed. See, e.g., *Vas-Cath, Inc.*, 935 F.2d at 1563-64, 19 USPQ2d at 1117.

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Possession may be shown in many ways. For example, possession may be shown by describing an actual reduction to practice of the claimed invention. Possession may also be shown by a clear depiction of the invention in detailed drawings or in structural chemical formulas which permit a person skilled in the art to clearly recognize that applicant had possession of the claimed invention. An adequate written description of the invention may be shown by any description of sufficient, relevant, identifying characteristics so long as a person skilled in the art would recognize that the inventor had possession of the claimed invention. See, e.g., *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1323, 56 USPQ2d 1481, 1483 (Fed. Cir.2000)

Applicants respectfully assert that it is clear that one of ordinary skill would clearly understand that Applicants have explicitly described a precipitate forming additive.

Examiner has not presented evidence or reasons why a person skilled in the art would not recognize that the written description of the invention provides support for the claims.

Examiner has also not supported any assertion that such language constitutes new matter.

"Mere rephrasing of a passage does not constitute new matter. Accordingly, a rewording of a passage where the same

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meaning remains intact is permissible", *In re Anderson*, 471 F.2d 1237, 176 USPQ 331 (CCPA 1973).

"In order to satisfy the written description requirement, the disclosure as originally filed does not have to provide *in haec verba* support for the claimed subject matter", *Purdue Pharma L.P. v. Faulding Inc*, 230 F.3d 1320, 56 USPQ2d 1481 (Fed. Cir. 2000).

Applicants reproduce portions of the Specification with respect to b. "configured to add an additive" and d. "said outlet portion configured for adding a second additive":

See paragraphs 0033 and Figure 2:

"As hereinafter described, the CMP wastewater 43, along with the BG wastewater 47 and/or the BW wastewater 51, is distributed to the reaction tank 58, where a coagulant polymer 60, such as FSC-835, for example, binds to slurry particles in the wastewater and precipitates the particles out of solution. Chemical adjustments, such as pH adjustments, may also be made to the wastewater in the reaction tank 58. An outlet conduit 59 extends from the reaction tank 58, and a second coagulant polymer 62, such as EA-630, for

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example, is introduced into the outlet conduit 59, to bind slurry particles which remain unbound to the coagulant polymer 60 in the wastewater."

Thus one of ordinary skill would readily appreciate that Applicant has possession of the claimed invention as shown in Figure 2 including items 60 and 62 where it is shown that explicitly that the reaction tank and the outlet conduit include structure (is configured for) for adding coagulant polymer additive as shown in items 60 and 62 and as claimed in claims 1 and 9.

Examiner has not presented evidence or reasons why a person skilled in the art would not recognize that the written description of the invention provides support for the claims.

Examiner has also not supported any assertion that such language constitutes new matter.

With respect to C. "without overflow of said waste water", Applicants refer to the Specification where the batch reactor process is explained in detail:

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"A batch of the CMP wastewater 43/Cu-CMP wastewater 45 is distributed from the CMP wastewater collection tank 42 into the holding tank 54, **by operation of the pump or pumps 44.** A batch of the BG wastewater 47 is distributed from the BG wastewater collection tank 46 to the holding tank 54, by operation of the pump or pumps 48. A batch of the BW wastewater 51 is distributed from the backwash wastewater collection tank 50, to the reaction tank 58, **by operation of the pump or pumps 52.** Next, by operation of the pump or pumps 56, the CMP wastewater 43/Cu-CMP wastewater 45 and BG wastewater 47 **are distributed from the holding tank 54 into the reaction tank 58,** where the backwash wastewater 51, from the backwash wastewater collection tank 50, mixes with the CMP wastewater 43/Cu-CMP wastewater 45 and the BG wastewater 47 to form a combined wastewater.

Thus, one of ordinary skill would understand from the description of the operation of batch reaction that Applicants have described that Applicants have implicitly if not explicitly described an operation of a batch reaction tank "for receiving and sedimenting particles from a batch of wastewater **without**

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overflow of said wastewater comprising the first wastewater and the second wastewater", where the language without overflow **further describes a batch reaction process** as would be recognized by one of ordinary skill and in light of Applicants description of the batch reaction process **as opposed to an overflow continuous reaction process**, as described in the applied reference of Rice, recited as prior art.

Examiner has not presented evidence or reasons why a person skilled in the art would not recognize that the written description of the invention provides support for the claims.

Examiner has also not supported any assertion that such language constitutes new matter.

Thus, Examiner has failed to make out a *prima facie* case that Applicants claim language in claims 22-26 violates the written description requirement or constitutes new matter. See MPEP 2163.04(I):

In rejecting a claim, the examiner must set forth express findings of fact which support the lack of written description conclusion (see MPEP § 2163 for examination guidelines pertaining to the written description requirement). These findings should:

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(A) Identify the claim limitation at issue; and

(B) Establish a *prima facie* case by providing reasons why a person skilled in the art at the time the application was filed would not have recognized that the inventor was in possession of the invention as claimed in view of the disclosure of the application as filed.

Claim Rejections under 35 USC 103

2. Claims 1-16 stand rejected under 35 USC Section 103(a) as being unpatentable over Rice (US 2,640, 807) in view of Applicants alleged admitted prior art.

Rice discloses a **continuous flow reactor system** for treating **acid and cyanide waste waters** (liquids) (col 1, lines 1-30; e.g., claim 1). Rice discloses conditioning tanks for maintaining a **large body of sludge in the conditioning tanks bottom portion for passing the liquid waste effluent through** (col 2, lines 4-14).

In one embodiment, the wastewater treatment system of Rice passes a first wastewater (cyanide) from a first conditioning tank **through the sludge** to a second conditioning tank and subsequently **through the sludge** to a settling tank (col 2, lines

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15-21; Figures IV and V). In another embodiment, wastewater is passed from each conditioning tank to the settling tank (see Figure III).

In either embodiment, **lime and/or chlorine** are added (item 29 and 47) to the waste water supply line **prior to** the wastewater **reaching a respective conditioning tank**. Each of the conditioning tanks and settling tanks include downcomers (e.g., item 55 and 74 Figure 3) **to enhance liquid phase reactions** (col 6, lines 63-70). The wastewater is mixed with sludge at the bottom of the tank. The reacted waste water in the conditioning tanks **overflows as it builds up over treatment time** (i.e., a **continuous flow** of wastewater; **continuous flow reactor**) into an **annular trough** in the conditioning tank prior passing as effluent to the settling tank (col 6, lines 70-75). The waste water from the first conditioning tank and the second conditioning tank then passes into separate **concentrically positioned downcomers in the settling tank** (col 7, lines 50-55; lines 60-65) as part of a **continuous flow** reaction.

Thus, Rice fails to teach several aspects of Applicants disclosed and claimed invention.

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Among other elements of Applicants disclosed and claimed invention **Rice does not disclose a batch reactor system** or recognize or provide a solution to the problem that Applicants have recognized and solved by their disclosed and claimed invention:

"A system for **batch treating semiconductor manufacturing process wastewater to reduce an amount of precipitate forming additive required**"

Rather, Rice teaches a **continuous flow reactor system** for **treating liquid waste**, which an artist of ordinary skill clearly understands in very different and works by a different principle of operation from a **batch reactor system**.

Rice also fails to teach the following elements of Applicants disclosed and claimed invention including those elements in **bold type**:

1. (currently amended) A system for batch treating semiconductor manufacturing process wastewater to reduce an amount of

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precipitate forming additive required, comprising:

a first collection tank in fluid communication with a wafer backgrind apparatus for receiving a first wastewater comprising first particles;

a second collection tank in fluid communication with a planarization apparatus for receiving a second wastewater comprising second particles;

a batch reaction tank provided in fluid communication with said first collection tank and said second collection tank, said batch reaction tank for receiving and sedimenting particles from a batch of wastewater without overflow of said wastewater comprising the first wastewater and the second wastewater wherein said reaction tank is configured to add an additive to said batch to form a precipitate comprising said first and second particles for sedimentation; and

at least one clarifier provided in fluid communication with said batch reaction tank for separating said precipitate from said batch of wastewater.

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Nowhere does Rice disclose or suggest **forming precipitates in a batch reactor system, removing particles or precipitates from wastewater in a batch reactor system, or adding and additive that forms precipitates in a batch reactor system.** Rather, Rice discloses the use of **downcomers in both the conditioning tanks and the settling tanks for aiding in liquid phase reactions in a continuous flow reactor** where the conditioning tank includes downcomers and an annular structure **for allowing overflow of the wastewater which then travels to settling tanks** to remove the sludge introduced in the conditioning tank (where the wastewater passes through the sludge at the bottom).

Examiner argues that "it is submitted that the lime added to conditioning tanks A and B of Rice appears to form precipitates and particles in the form of sludge in the conditioning tanks". Examiner again overlooks the fact that Rice is disclosed and taught to operate in a continuous flow process and nowhere suggests a batch reaction process or batch reactor structure.

As such, Rice further does not disclose:

"at least one clarifier provided in fluid communication with

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said reaction tank for separating said precipitate from said batch of wastewater";

In Applicants disclosure, Applicants disclose a prior art process for **treating a single wastewater source** in a semiconductor manufacturing process (see pages 6 and 7 of Applicants Specification, and Figure 1). Applicants disclose a **single collection tank to feed a holding tank which feeds a reaction tank**. Nowhere do Applicants disclose or suggest Applicants disclosed and claimed invention including a first collection tank **in fluid communication with a wafer backgrind apparatus** for receiving a first wastewater comprising first particles; or a second collection tank **in fluid communication with a CMP apparatus** for receiving a second wastewater comprising second particles; or suggest a solution to the problem that Applicants have recognized and solved by their disclosed and claimed invention:

"A system for batch treating semiconductor manufacturing process wastewater **to reduce an amount of precipitate forming additive required**"

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Moreover, there appears to be no motivation to combine the teachings of Rice and Applicants alleged admitted prior art, **other than Applicants disclosure**. The **liquid phase continuous flow reactors** of Rice which **includes sludge in the bottom of the conditioning tank** through which the liquid wastewater is forced to pass (in continuous flow) and an **annular overflow portion** to collect the treated waste water **prior to passing to the settling tank to remove any remaining sludge**, works by a different principal of operation than the disclosed **batch reaction tank** of Applicants for carrying out **sedimentation** of precipitates formed from particles in the wastewater in Applicants discussion of the prior art, and **could not accomplish Applicants disclosed and claimed process**.

Examiner argues that Applicants have not presented factual evidence to support the argument that Rice works by a different principle of operation i.e., **liquid phase continuous flow reactor** of Rice versus **batch reactor precipitation to remove particles** of Applicants disclosed and claimed invention.

It is respectfully noted by Applicants that **Examiner has the burden establishing a prima facie case**, and that Applicants have

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do not have the burden of submitting factual evidence with respect to what one of ordinary skill would appreciate (i.e., liquid phase continuous flow reactor versus **batch precipitation reactor to remove particles**) especially where the elements of Applicants disclosed and claimed invention have not been shown in the prior art. Moreover, Applicants have no burden of presenting factual evidence for what Rice does not teach (a batch reaction system), as Examiner appears to argue.

Examiner also argues that Rice **does not appear to be** limited to continuous flow operation and **would appear to be capable of** batch operation. Examiner points to no teaching or structure of Rice to support this argument. Rather, it is clear that the apparatus of Rice including **passing the liquid wastewater through sludge at the bottom of the tank and the annular overflow portion to capture the treated wastewater** would be superfluous and not operate as intended with a batch reactor system (i.e., wastewater would not pass through the sludge at the bottom of the reactor-**taught to be a critical aspect of the system**).

"A prior art reference must be considered in its entirety, i.e., as a whole including portions that would lead away from the

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claimed invention." *W.L. Gore & Associates, Inc., Garlock, Inc.,*
721 F.2d, 1540, 220 USPQ 303 (Fed Cir. 1983), cert denied, 469
U.S. 851 (1984).

Examiner also argues that Applicants **do not exclude downcomers and annular overflow portions** of Rice from the instant claims. Applicants respectfully note that **downcomers and overflow portions are used in continuous flow reactors** as taught by Rice, and one of ordinary skill would understand that such structures are inconsistent with (superfluous/useless) in the operation of **batch reactors**.

Moreover, Examiner has pointed to no support in the MPEP or case law that requires Applicants claims to exclude superfluous and non-operational structure with respect to a batch reactor (e.g., downcomers or annular overflow portions) to define over a prior art reactor that operates by a different principle of operation (continuous flow).

Examiner argues that irregardless of the fact that Rice does not disclose or suggest a batch reactor structure that since Applicants disclose a batch reactor in the prior art, this is

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sufficient.

However, Examiner is impermissibly looking to Applicants disclosure to find motivation for modifying the prior art structure of Rice. Moreover, the modification of the structure of Rice to a batch reactor changes the principle of operation of the system of Rice would make the system of Rice unsuitable for its intended operation, thus eliminating any motivation for combination with Applicants disclosed prior art.

Examiner's response to the above dilemma is that Examiner has **deemed the case law explicitly supporting the above argument not pertinent** due to the different circumstances involved in the instant Application. Examiner has not identified such circumstances or supplied support for the notion that the Examiner may disregard clear guidance in the case law and the MPEP.

Nevertheless, even assuming *arguendo* a proper motivation for combining the teachings Rice and Applicants discussion of the prior art, which Applicants do not concede, such combination does not produce **all the claims limitations** of Applicants disclosed

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and claimed invention.

Finally, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success **must both be found in the prior art, and not based on applicant's disclosure**. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

"The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810, 123, USPQ 349 (CCPA 1959).

"If proposed modification would render the prior art

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invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

"Finally, when evaluating the scope of a claim, every limitation in the claim must be considered. Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered." See, e.g., *Diamond v. Diehr*, 450 U.S. at 188-189, 209 USPQ at 9.

"The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).

"[A] patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once

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the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103." *In re Spinnoble*, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969).

Conclusion

Since Rice alone, or in combination with Applicants disclosure, does not produce Applicants disclosed and claimed invention, nor recognizes the problem or provide a solution to the problem that Applicants have recognized and solved, neither has a *prima facie* case of obviousness been made out with respect to Applicants independent and dependent claims.

Based on the foregoing, Applicants respectfully submit that Applicants Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

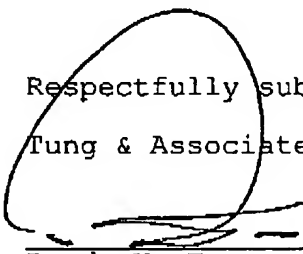
In the event that the present invention as claimed is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his

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Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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